NsG-142

New Mexico State University Observatory
University Park, New Mexico
1 July 1964--30 June 1965

Personnel. The present staff consists of the following: Dr. Clyde W. Tombaugh, Astronomer and Supervisor; Bradford A. Smith, Associate Astronomer and Director of the Observatory; J. C. Robinson, Associate Astronomer; Charles F. Mozer, Assistant Physicist; Thomas B. Kirby, Junior Physicist; Elmer J. Reese, Data Analyst; Robert L. Fritz, Photographic Technician; A. Scott Murrell, Chief Observer; James D. Hartsell, Observer; William R. Bains, Observer; Thomas P. Pope, Observer. Part-time students assisting with the work over the past year were Charles A. Richey, graduate student in physics; Walter E. Bains and H. Gordon Solberg, undergraduate students in physics.

Equipment and Use. The observatory building on Tortugas Mountain was completed in July 1964. It is situated five miles east of the campus, at an altitude of 4,760 feet above sea level and 870 feet above Las Cruces. Seeing conditions for fine planetary detail have proved to be very satisfactory during this first year of operation. The two principal instruments are a 12-inch Fecker Newtonian--Cassegrainian (2m, 6m and 20m focal lengths); and a 16-inch Gregorian (14 m.f.l.)

RESEARCH

Photographic Observations. A total of 2,332 plates of the planets was taken with the Fecker telescope at the 20-m Cassegrain

focus during the past year of this report. Nearly all photographs were taken on Eastman Spectrographic plates through Schott filters where applicable. The planetary patrol consists of taking photographs in ultraviolet, blue, green, orange-red and infrared wavelengths in rapid succession.

Venus was in superior conjunction and inaccessible for observation during part of this period. Also, Mars and Jupiter were given higher priority. Hence, only 283 plates were taken of Venus on 98 days.

Mars was at opposition on 9 March 1965, and 897 plates were taken on 154 nights. The photographic and visual patrol is still in progress at the close of this period and was carried beyond the usual limit because of the special interest in Mariner 4. Most of the plates are of good quality and all contain useful information. Daily perusal of the Mars photographs, selections for composites, and some reductions were undertaken by Robinson.

Jupiter was in opposition on 13 November 1964. A total of 1,080 plates was taken on 231 nights. A large number are of outstanding quality. Reese and Solberg measured and reduced a large number of Jupiter images for size of various markings, their zenographic coordinates and rotation periods.

Saturn. Fifty-one plates were taken of Saturn on 30 nights.

Moon. Only 17 plates were taken of selected portions of the moon on 8 nights.

Fritz made approximately 150 composite copies of Venus, several hundred of Mars, 33 of Jupiter and a few of Saturn.

Approximately 150 Mars composites were made of the longitudes of the expected Mariner 4 sweep region. Copies of these were sent to the international planetary plate depository center at the Lowell Observatory, Flagstaff, Arizona.

Photoelectric Observations. A program of photoelectric photometry of Mars was started by Smith, Kirby, and Robinson on 26 March in the standard UBV system. A red-orange reading was added to the series in early April. As of 30 June approximately 180 UBV(R) sets of observations had been obtained. Observations were made at the 14-meter focus of the 16-inch Gregorian reflector, using an unrefrigerated IP21 at reduced interdynode potential. The data is being processed by a Burroughs 220.

Visual Observations. Reese made 2,304 central meridian transits, visually, of 130 different spots in 15 currents of different rotational periods. Reese observed Jupiter visually on 186 nights, mostly with Tombaugh's 16-inch f10 Newtonian telescope with a magnification of 524 diameters. He made 35 drawings of selected portions of Jupiter, 4 of the full disk, and 4 of the markings on two satellites of Jupiter.

Reese observed Mars visually on 21 nights, and made 19 drawings.

Reese observed Saturn visually on about two dozen nights.

Tombaugh observed Saturn visually on 75 nights with his 16-inch telescope on a regular patrol for possible outbursts of activity. Also, he observed Jupiter on approximately 40 nights.

Tombaugh observed Mars visually on 73 nights with his 16-inch reflector, and made 41 drawings of the planet.

Publications. Five research papers on Mars and Jupiter were published, and submitted for publication, in astronomical journals.

Reese, E. J. "Jupiter in 1963-64: Rotation Periods," Journal of the Association of Lunar and Planetary Observers, 18, 85 (1964).

Smith, B. A. "Unusual Spot on Jupiter," Harvard College Observatory Announcement Card 1673, November 17, 1964.

Smith, B. A., and Reese, E. J. "A Jovian Feature of Special Interest," TN-557-65-5, New Mexico State University Observatory, November, 1964. Published in Sky and Telescope, February, 1965.

Tombaugh, C. W. A revised and expanded edition of "The Absence of an Aqueous Morphology on Mars and Some Geological Consequences," TN-557-65-6, New Mexico State University Observatory, February, 1965. Submitted to Icarus for publication.

Other papers are in preparation.

Tombaugh and Smith participated in the 12th meeting of the International Astronomical Union at Hamburg, Germany, 25 August through 3 September, 1964. Smith read a paper entitled "Rapid Changes in the Position and Appearance of Jovian Features." Smith visited the Meudon Observatory (France) later to discuss international cooperation in planetary studies.

Teaching. Tombaugh was on half-time teaching status during the fall and spring semesters in astronomy, planetology, and meteorology.

Support. Total support for the research in planetary studies came from the National Aeronautics and Space Administration.

Clyde W. Tombaugh
Astronomer and Supervisor